

# LOW VOLTAGE POWER CAPACITORS





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# Low Voltage Power Capacitors



## Features

### Durability and reliability

Material - Metallized polypropylene film (MPP) with good voltage-withstand and with good dielectric properties, which is capable of self-healing is employed as an dielectric, if any damage is caused on the dielectric, the metallized electrode around the damage point will be immediately vaporized, and then, the ability of insulation is restored, capacitor will continue to operate functionally.

### Efficiency

Compact size with light weight, easy for installation and transportation.

### Cost-effective

Low losses on the dielectric and low temperature rise with long service life which is cost efficient in the investment.

### International standard

Conform to GB, JIS, IEC standard, the individual subsidiary capacitor which built inside are all equipped with an internal safety devices (UL certified). The safety device will be activated if any fault is developed on the capacitor or the circuit to cut off the power, prevent the potential secondary damage to the equipment.

### Safety

Equipped with the discharge resistor, ensure the safety in all kind of application and the safety of maintenance.

### Eco-friendly

Sealed with the eco-friendly flame-resistant epoxy resin (UL-94V0), there is no possibility of oil-leakage during operation, avoid the environment pollution.

## Specifications and performances

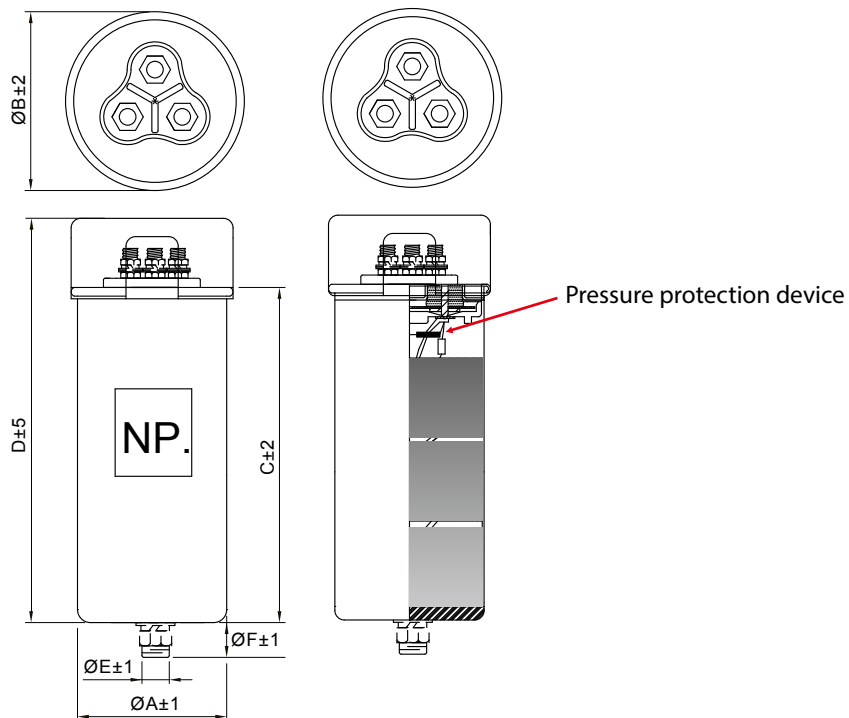
- For power factor improvement used for Indoor application
- Operation environment: ambient temperature  $-25^{\circ}\text{C} \sim 45^{\circ}\text{C}$ , humidity  $\leq 95\%$ , altitude below 4,000 m.
- Max. operation voltage: 110% of rated voltage
- Max. operation current: 130% of rated current
- Capacity tolerance:  $-5\% \sim +10\%$  of rated value
- Dielectric losses: less than 0.2 W/kVAR
- Temperature rise: lower than  $25^{\circ}\text{C}$  when ambient temperature is lower than  $40^{\circ}\text{C}$
- Sealing capability: no oil leakage if heated in the tank with constant temperature  $70 \pm 3^{\circ}\text{C}$  for two hours
- Discharge characteristic: built-in internal discharge resistors, terminal voltage will drop to 50 volts or less in three minutes after the capacitor has been disconnected.
- Meet the requirement of GB 12747-91, JIS C4901 and IEC 831 standard.

## A. Cylindrical Self-healing Low Voltage Shunt Capacitors (For steady electrical power field)



**Dimensions :**

Wiring terminals	Dimensions (mm)					
	A	B	C	D	E	F
M6	70	74	280	310	12	15
	70	74	245	285	12	15
M8	86	90	245	285	12	15
	86	90	280	320	12	15
	116	120	245	285	16	25
	116	120	290	320	16	25
M10	136	140	245	275	16	25
	136	140	290	320	16	25



Cat. No.	Rated capacity 220V (kVar)	Rated capacity 250V (kVar)	Rated current (A)	Rated capacity (µF)	Dimensions (mm) A × C
<b>Rated voltage: 250V, 1Ø, 50Hz (System voltage: 220V)</b>					
SH-R250502R5S	1.94	2.5	10.0	127	70 × 150
SH-R250503S	2.32	3	12.0	153	70 × 245
SH-R250505S	3.9	5	20.0	255	70 × 245
SH-R250507R5S	5.81	7.5	30.0	382	70 × 280
SH-R250510S	7.74	10	40.0	510	86 × 245
SH-R250512R5S	9.68	12.5	50.0	637	116 × 245
SH-R250515S	11.62	15	60.0	765	116 × 245
SH-R250518S	13.94	18	72.0	917	136 × 245
SH-R250520S	15.49	20	80.0	1019	136 × 245

- Note: 1. For dimensions and more details, please consult us.  
 2. Other capacity & voltages upon request.  
 3. If higher capacity demand, SH-S series(Box type) capacitor is recommended.

Cat. No.	Rated capacity 400V (kVar)	Rated capacity 415V (kVar)	Rated current (A)	Rated capacity ( $\mu$ F)	Dimensions (mm) A $\times$ C
<b>Rated voltage: 415V, 3<math>\emptyset</math>, 50Hz (System voltage: 380V, 400V)</b>					
SH-R415502R5T	2.32	2.5	3.5	46	70 $\times$ 150
SH-R415503T	2.79	3	4.2	55	70 $\times$ 245
SH-R415505T	4.65	5	7.0	92	70 $\times$ 245
SH-R415507R5T	6.97	7.5	10.4	139	70 $\times$ 245
SH-R415510T	9.29	10	13.9	185	86 $\times$ 245
SH-R415512R5T	11.61	12.5	17.4	231	116 $\times$ 245
SH-R415515T	13.94	15	20.9	277	116 $\times$ 245
SH-R415518T	16.72	18	25.0	333	116 $\times$ 245
SH-R415520T	18.58	20	27.8	370	116 $\times$ 245
SH-R415525T	23.23	25	34.8	462	116 $\times$ 290
SH-R415530T	27.87	30	41.7	555	136 $\times$ 290
SH-R415535T	31.52	35	48.7	647	136 $\times$ 290
SH-R415540T	37.16	40	55.6	740	136 $\times$ 290

Cat. No.	Rated capacity 400V (kVar)	Rated capacity 440V (kVar)	Rated current (A)	Rated capacity ( $\mu$ F)	Dimensions (mm) A $\times$ C
<b>Rated voltage: 440V, 3<math>\emptyset</math>, 50Hz (System voltage: 380V, 400V)</b>					
SH-R440502R5T	2.07	2.5	3.3	41	70 $\times$ 150
SH-R440503T	2.48	3	3.9	49	70 $\times$ 245
SH-R440505T	4.13	5	6.6	82	70 $\times$ 245
SH-R440507R5T	6.21	7.5	9.8	123	70 $\times$ 245
SH-R440510T	8.26	10	13.1	164	86 $\times$ 245
SH-R440512R5T	10.33	12.5	16.4	206	86 $\times$ 245
SH-R440515T	12.39	15	19.7	247	116 $\times$ 245
SH-R440520T	16.52	20	26.2	329	116 $\times$ 245
SH-R440525T	20.65	25	32.8	411	116 $\times$ 245
SH-R440530T	24.78	30	39.4	493	116 $\times$ 290
SH-R440535T	28.91	35	45.9	575.7	136 $\times$ 290
SH-R440540T	33.04	40	52.5	658	136 $\times$ 290

Note: 1. For dimensions and more details, please consult us.

2. Other capacity & voltages upon request.

3. If higher capacity demand, SH-S series(Box type) capacitor is recommended.



Cat. No.	Rated capacity 400V (kVar)	Rated capacity 480V (kVar)	Rated current (A)	Rated capacity ( $\mu$ F)	Dimensions (mm) A×C
<b>Rated voltage: 480V, 3<math>\emptyset</math>, 50Hz (System voltage: 380V, 400V)</b>					
SH-R480502R5T	1.74	2.5	3.0	35	70×150
SH-R480503T	2.08	3	3.6	41	70×245
SH-R480505T	3.47	5	6.0	69	70×245
SH-R480507R5T	5.21	7.5	9.0	104	70×245
SH-R480510T	6.94	10	12.0	138	86×245
SH-R480512R5T	8.68	12.5	15.0	173	86×245
SH-R480515T	10.41	15	18.0	207	116×245
SH-R480518T	12.49	18	21.7	249	116×245
SH-R480520T	13.88	20	24.1	276	116×245
SH-R480525T	17.35	25	30.1	346	116×290
SH-R480530T	20.82	30	36.1	415	116×290
SH-R480535T	24.29	35	42.1	483.8	136×290
SH-R480540T	27.78	40	48.1	552.9	136×290

Cat. No.	Rated capacity 400V (kVar)	Rated capacity 525V (kVar)	Rated current (A)	Rated capacity ( $\mu$ F)	Dimensions (mm) A×C
<b>Rated voltage: 525V, 3<math>\emptyset</math>, 50Hz (System voltage: 380V, 400V)</b>					
SH-R525502R5T	1.45	2.5	2.7	29	70×150
SH-R525503T	1.74	3	3.3	35	70×245
SH-R525505T	2.9	5	5.5	58	70×245
SH-R525507R5T	4.35	7.5	8.2	87	86×245
SH-R525510T	5.8	10	11	116	86×245
SH-R525512R5T	7.25	12.5	13.7	144	116×245
SH-R525515T	8.7	15	16.5	173	116×245
SH-R525518T	10.44	18	19.8	208	116×245
SH-R525520T	11.6	20	22	231	116×245
SH-R525525T	14.5	25	27.5	289	116×290
SH-R525530T	17.4	30	33	346	116×290
SH-R525535T	20.3	35	38.5	404.4	136×245
SH-R525540T	23.2	40	44	462	136×290

- Note: 1. For dimensions and more details, please consult us.  
 2. Other capacity & voltages upon request.  
 3. If higher capacity demand, SH-S series(Box type) capacitor is recommended.

### Dimensions :

Wiring terminals	Dimensions (mm)					
	A	B	C	D	E	F
Clamp-tight terminal	76	74	280	310	12	15
	76	74	245	285	12	15
	86	90	245	285	12	15
	86	90	280	320	12	15
	116	120	245	285	16	25
	116	120	290	320	16	25
	136	140	245	275	16	25
	136	140	290	320	16	25



Cat. No.	Rated capacity 220V (kVar)	Rated capacity 250V (kVar)	Rated current (A)	Rated capacity ( $\mu$ F)	Dimensions (mm) A×C
<b>Rated voltage: 250V, 1<math>\emptyset</math>, 50Hz (System voltage: 220V)</b>					
SH-B250502R5S	1.94	2.5	10.0	127	76×245
SH-B250503S	2.32	3	12.0	153	76×245
SH-B250505S	3.9	5	20.0	255	76×245
SH-B250507R5S	5.81	7.5	30.0	382	76×245
SH-B250510S	7.74	10	40.0	510	86×245
SH-B250512R5S	9.68	12.5	50.0	637	116×245
SH-B250515S	11.62	15	60.0	765	136×290

Cat. No.	Rated capacity 400V (kVar)	Rated capacity 415V (kVar)	Rated current (A)	Rated capacity ( $\mu$ F)	Dimensions (mm) A×C
<b>Rated voltage: 415V, 3<math>\emptyset</math>, 50Hz (System voltage: 380V, 400V)</b>					
SH-B415502R5T	2.32	2.5	3.5	46	76×245
SH-B415503T	2.79	3	4.2	55	76×245
SH-B415505T	4.65	5	7.0	92	76×245
SH-B415507R5T	6.97	7.5	10.4	139	76×245
SH-B415510T	9.29	10	13.9	185	86×245
SH-B415512R5T	11.61	12.5	17.4	231	116×245
SH-B415515T	13.94	15	20.9	277	116×245
SH-B415518T	16.72	18	25.0	333	116×245
SH-B415520T	18.58	20	27.8	370	116×245
SH-B415525T	23.23	25	34.8	462	116×290
SH-B415530T	27.87	30	41.7	555	136×290

Note: 1. For dimensions and more details, please consult us.

2. Other capacity & voltages upon request.

3. If higher capacity demand, SH-S series(Box type) capacitor is recommended.

Cat. No.	Rated capacity 400V (kVar)	Rated capacity 440V (kVar)	Rated current (A)	Rated capacity ( $\mu$ F)	Dimensions (mm) A×C
<b>Rated voltage: 440V, 3<math>\phi</math>, 50Hz (System voltage: 380V, 400V)</b>					
SH-B440502R5T	2.07	2.5	3.3	41	76×245
SH-B440503T	2.48	3	3.9	49	76×245
SH-B440505T	4.13	5	6.6	82	76×245
SH-B440507R5T	6.21	7.5	9.8	123	76×245
SH-B440510T	8.26	10	13.1	164	86×245
SH-B440512R5T	10.33	12.5	16.4	206	86×245
SH-B440515T	12.39	15	19.7	247	116×245
SH-B440518T	14.87	18	23.6	296	116×245
SH-B440520T	16.52	20	26.2	329	116×245
SH-B440525T	20.65	25	32.8	411	116×245
SH-B440530T	24.78	30	39.4	493	116×290
SH-B440535T	28.91	35	45.9	575.7	136×290

Cat. No.	Rated capacity 400V (kVar)	Rated capacity 480V (kVar)	Rated current (A)	Rated capacity ( $\mu$ F)	Dimensions (mm) A×C
<b>Rated voltage: 480V, 3<math>\phi</math>, 50Hz (System voltage: 380V, 400V)</b>					
SH-B480502R5T	1.74	2.5	3.0	35	76×245
SH-B480503T	2.08	3	3.6	41	76×245
SH-B480505T	3.47	5	6.0	69	76×245
SH-B480507R5T	5.21	7.5	9.0	104	70×245
SH-B480510T	6.94	10	12.0	138	86×245
SH-B480512R5T	8.68	12.5	15.0	173	86×245
SH-B480515T	10.41	15	18.0	207	116×245
SH-B480518T	12.49	18	21.7	249	116×245
SH-B480520T	13.88	20	24.1	276	116×245
SH-B480525T	17.35	25	30.1	346	116×290
SH-B480530T	20.82	30	36.1	415	116×290

Cat. No.	Rated capacity 400V (kVar)	Rated capacity 525V (kVar)	Rated current (A)	Rated capacity ( $\mu$ F)	Dimensions (mm) A×C
<b>Rated voltage: 525V, 3<math>\phi</math>, 50Hz (System voltage: 380V, 400V)</b>					
SH-B525502R5T	1.45	2.5	2.7	29	76×245
SH-B525503T	1.74	3	3.3	35	76×245
SH-B525505T	2.9	5	5.5	58	76×245
SH-B525507R5T	4.35	7.5	8.2	87	86×245
SH-B525510T	5.8	10	11	116	86×245
SH-B525512R5T	7.25	12.5	13.7	144	116×245
SH-B525515T	8.7	15	16.5	173	116×245
SH-B525518T	10.44	18	19.8	208	116×245
SH-B525520T	11.6	20	22	231	116×245
SH-B525525T	14.5	25	27.5	289	116×290

- Note: 1. For dimensions and more details, please consult us.  
2. Other capacity & voltages upon request.  
3. If higher capacity demand, SH-S series(Box type) capacitor is recommended.

## B. Oval-shaped Self-healing Low Voltage Shunt Capacitors



## Features

Material - Metallized polypropylene film (MPP) with good voltage-withstand and with good dielectric properties, which is capable of self-healing is employed as a dielectric, if any damage is caused on the dielectric, the metallized electrode around the damage point will be immediately vaporized and, then, the ability of insulation is restored, capacitor will continue to operate functionally.

Capacitor is sealed with aluminum case, due to the dielectric directly contact with the case, heat is transmitted outside of capacitor, temperature rise is relatively low with long service life.

The protective transparent cover, it is easy to check the connection of the terminal and lead wire, prevent spark/flash due to the bad connection.

Double protection is ensured. Fuse is embedded into each unit of elements and the whole capacitor unit to ensure the safety and prevent the accident occurrence.

Low losses on the dielectric and low temperature rise with long service life which is cost efficient in the investment.

Equipped with the discharge resistor, ensure the safety in all kinds of application and the safety of maintenance.

Sealed with the eco-friendly flame-resistant epoxy resin, there is no possibility of oil-leakage during operation, also avoid the environment pollution.



Dimensions - SH-ES series



Figure 1

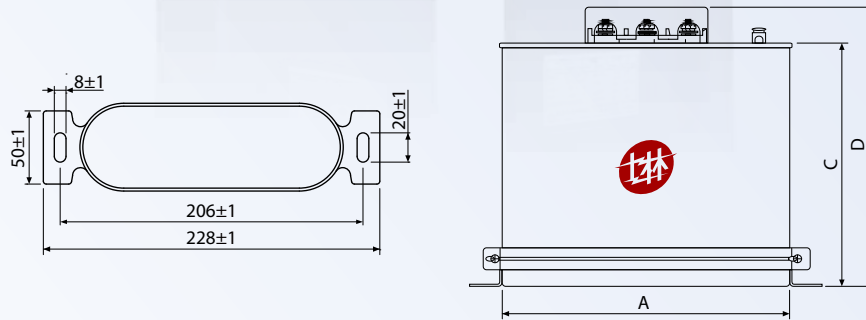
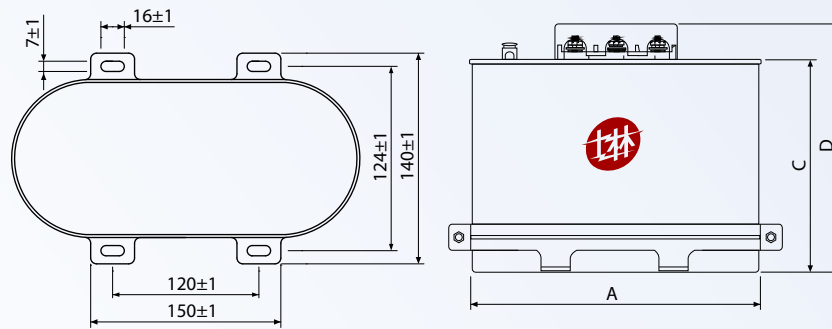


Figure 2



Rated voltage: 440V, 3Ø, 50Hz (System voltage: 380V)

Cat. No.	System Voltage (VAC)	Rated Voltage (VAC)	Capacity		Current (A)	Dimensions (mm)				(Kg)	Drawing
			kVar	µF		A	B	C	D		
SH-E440510T	380	440	10	164	13.1	183	66	200	235	2.0	Figure 1
SH-E440515T			15	247	19.7	183	66	200	235	2.0	
SH-E440516T			16	263	21.0	183	66	200	235	2.0	
SH-E440520T			20	329	26.2	250	100	200	250	3.1	Figure 2
SH-E440525T			25	411	32.8	250	100	200	250	3.2	
SH-E440530T			30	493	39.4	250	100	200	250	3.4	

Note: 1. For dimensions and more details, please consult us.  
 2. Other capacity & voltages upon request

**Rated voltage: 250V, 1Ø, 50Hz (System voltage: 220V) Two terminals**

Cat. No.	Rated Voltage (VAC)	Capacity		Current	Terminal	Dimensions (mm)				Drawing
		kVar	µF	(A)		A	B	C	D	
SH-KMJ250502R5S	250	2.5	41	10.0	M8	183	66	140	175	Figure 1
SH-KMJ250505S		5	82	20.0	M8	183	66	140	175	
SH-KMJ250507R5S		7.5	123	30.0	M8	183	66	140	175	
SH-KMJ250510S		10	164	40.0	M8	183	66	220	255	Figure 1
SH-KMJ250512R5S		12.5	206	50.0	M8	183	66	220	255	
SH-KMJ250515S		15	247	60.0	M8	183	66	220	255	

**Rated voltage: 250V, 1Ø, 50Hz (System voltage: 220V) Four terminals**

Cat. No.	Rated Voltage (VAC)	Capacity		Current	Terminal	Dimensions (mm)				Drawing	Note
		kVar	µF	(A)		A	B	C	D		
SH-KMJ250502R5S-3	250	2.5×3	41	10.0	M6	183	66	140	175	Figure 1	Consist by 3×2.5kVAR
SH-KMJ250503R33S-3		3.33×3	55	13.3	M6	183	66	220	255	Figure 1	Consist by 3×3.33kVAR
SH-KMJ250505S-3		5×3	82	20.0	M6	183	66	220	255	Figure 1	Consist by 3×5kVAR
SH-KMJ250506R67S-3		6.67×3	110	26.7	M8	250	100	220	255	Figure 2	Consist by 3×6.67kVAR
SH-KMJ250507R5S-3		7.5×3	123	30.0	M8	250	100	220	255	Figure 2	Consist by 3×7.5kVAR

**Rated voltage: 440V, 3Ø, 50Hz (System voltage: 380~400V) Three terminals**

Cat. No.	Rated Voltage (VAC)	Capacity		Current	Terminal	Dimensions (mm)				Drawing	Note
		kVar	µF	(A)		A	B	C	D		
SH-KMJ440505T	440	5	82	6.6	M6	183	66	140	175	Figure 1	System voltage: 380V or 440V. capacitor rated voltage 440V and above is advised.
SH-KMJ440510T		10	164	13.1	M6	183	66	140	175	Figure 1	
SH-KMJ440515T		15	247	19.7	M6	183	66	220	255	Figure 1	
SH-KMJ440518T		18	296	23.6	M6	183	66	220	255	Figure 1	Application: * SC is controlled by APFR or connected SC in parallel or high harmonic in the circuit. * SR 6%/ 7% is connected in series.
SH-KMJ440520T		20	329	26.2	M6	183	66	220	255	Figure 1	
SH-KMJ440525T		25	411	32.8	M8	250	100	220	255	Figure 2	
SH-KMJ440530T		30	493	39.4	M8	250	100	220	255	Figure 2	

Note: 1. For dimensions and more details, please consult us.  
2. Other capacity & voltages upon request

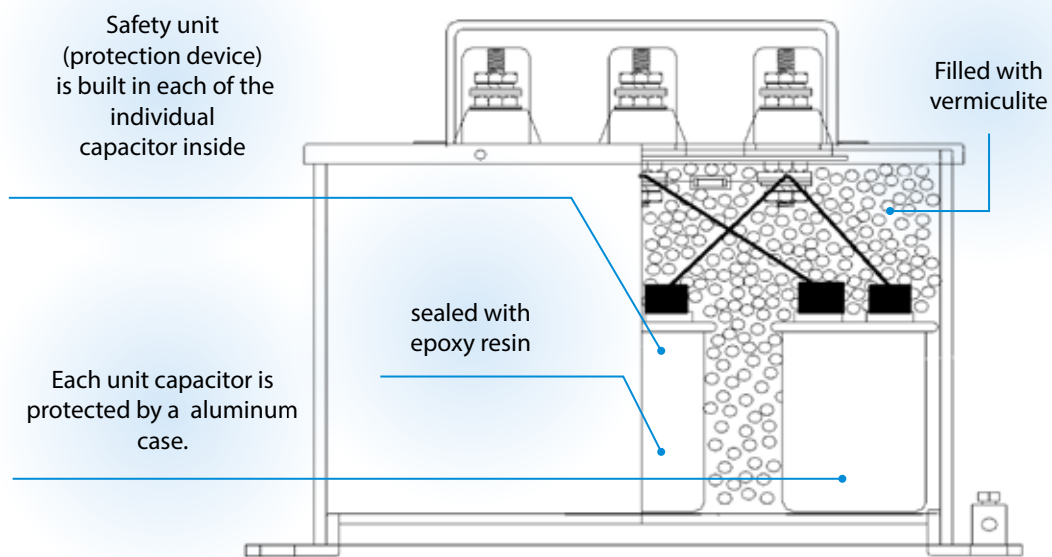
### C. Dry Type Explosion Proof Capacitors





## Features

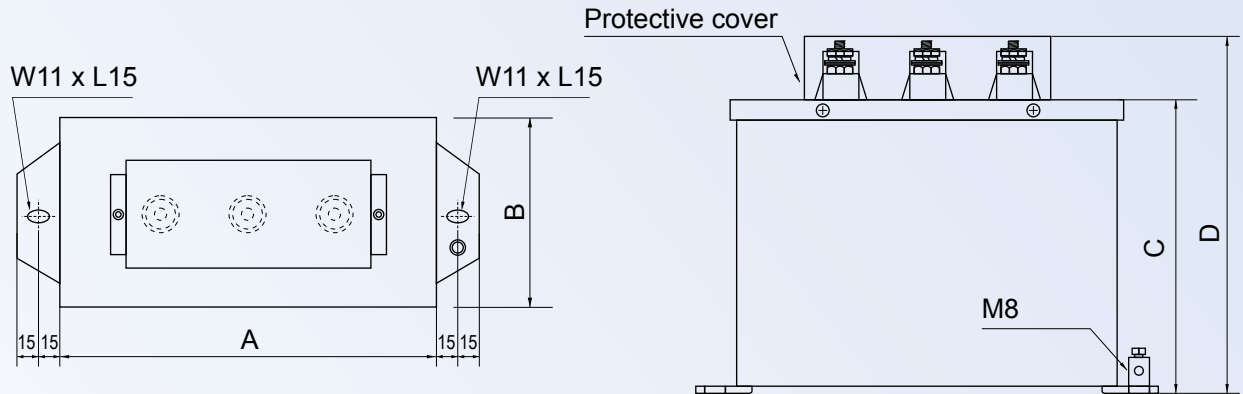
The housing of the capacitor is made of high-tensile steel and filled with fire-resistant vermiculite. In the event of any failure, the internal protection units will immediately cut off the power. However, if the energy (heat) is released when failure occurs, vermiculite will function to isolate the air to prevent flaming. And, moreover, being able to absorb the impact from the possible explosion, avoid the distortion of the steel housing and the possible accident.



Double secured protection



## Dimension



### Rated voltage: 260V, 3Ø, 50Hz (System voltage: 220V)

Cat. No.	System Voltage (VAC)	Rated Voltage (VAC)	Capacity		Current (A)	Dimensions (mm)				(Kg)	Application
			kVar	µF		A	B	C	D		
SH-S260510T	220	260	10	471	22.2	220	75	250	320	3.2	System voltage: 220V
SH-S260515T			15	707	33.3	230	130	250	320	3.2	* SC is controlled by APFR or connected with SC in parallel.
SH-S260520T			20	942	44.4	230	185	250	320	5.6	* SR 6% is connected in series
SH-S260525T			25	1178	55.5	230	185	250	320	5.6	
SH-S260530T			30	1413	66.6	350	140	250	320	5.6	* High harmonic in the circuit causing voltage increase
SH-S260535T			35	1649	77.7	350	140	370	440	8.2	
SH-S260540T			40	1884	88.8	350	140	370	440	8.2	
SH-S260545T			45	2120	99.9	350	140	470	540	8.2	
SH-S260550T			50	2356	111.0	350	140	470	540	10.4	

### Rated voltage: 440V, 3Ø, 50Hz (System voltage: 380V, 400V)

Cat. No.	System Voltage (VAC)	Rated Voltage (VAC)	Capacity		Current (A)	Dimensions (mm)				(Kg)	Application
			kVar	µF		A	B	C	D		
SH-S440505T	380	440	5	82	6.6	200	75	250	320	3.2	System voltage: 380V or 400V
SH-S440510T			10	164	13.1	200	75	250	320	3.2	* SC is controlled by APFR or connected with SC in parallel.
SH-S440515T			15	247	19.7	200	75	250	320	3.2	* SR 6% is connected in series.
SH-S440520T			20	329	26.2	230	130	250	320	5.6	
SH-S440525T			25	411	32.8	230	130	250	320	5.6	* Low-degree harmonic in the circuit will rise voltage slightly.
SH-S440530T			30	493	39.4	230	130	250	320	5.6	
SH-S440535T			35	576	45.9	230	185	250	320	8.2	
SH-S440540T			40	658	52.5	230	185	250	320	8.2	} Connect 6% SR is highly recommended
SH-S440545T			45	740	59.0	230	185	250	320	8.2	
SH-S440550T			50	822	65.6	350	140	370	440	10.4	
SH-S440560T			60	987	78.7	350	140	370	440	10.4	
SH-S440570T			70	1151	91.9	350	140	470	540	13.0	
SH-S440575T			75	1234	98.4	350	140	470	540	13.2	

**Rated voltage: 480V, 3Ø, 50Hz (System voltage: 380V, 400V)**

Cat. No.	System Voltage (VAC)	Rated Voltage (VAC)	Capacity		Current (A)	Dimensions (mm)				(Kg)	Application
			kVar	µF		A	B	C	D		
SH-S480510T	380	480	10	138	12.0	200	75	250	320	3.2	System voltage: 380V or 400V * SC is controlled by APFR or connected with SC in parallel. * SR 7% is connected in series. * High-degree harmonic in the circuit will rise voltage.  Connect with 7% SR is highly recommended.
SH-S480515T			15	207	18.0	220	75	250	320	3.2	
SH-S480520T			20	276	24.1	220	140	250	320	5.6	
SH-S480525T			25	346	30.1	220	140	250	320	5.6	
SH-S480530T			30	415	36.1	220	140	250	320	5.6	
SH-S480535T			35	484	42.1	350	140	250	320	8.2	
SH-S480540T			40	553	48.1	350	140	250	320	8.2	
SH-S480545T			45	622	54.1	350	140	250	320	8.2	
SH-S480550T			50	691	60.1	350	140	370	440	10.4	
SH-S480560T			60	829	72.2	350	140	370	440	10.4	
SH-S480570T			70	968	84.2	350	140	470	540	12.6	
SH-S480575T			75	1037	90.2	350	140	470	540	12.6	
SH-S480580T			80	1106	96.2	350	140	470	540	12.6	
SH-S480590T			90	1244	108.3	350	140	470	540	14.8	
SH-S4805100T			100	1382	120.3	420	140	470	540	16	

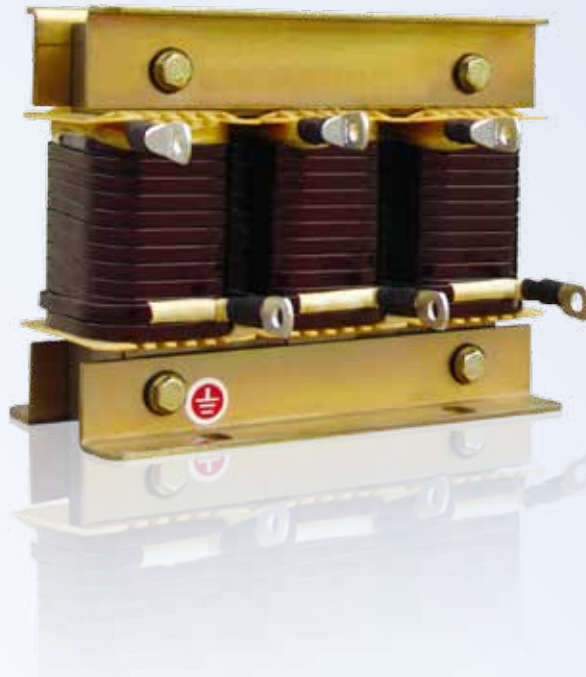
**Rated voltage: 525V, 3Ø, 50Hz (System voltage: 380V, 400V)**

Cat. No.	System Voltage (VAC)	Rated Voltage (VAC)	Capacity		Current (A)	Dimensions (mm)				(Kg)	Application
			kVar	µF		A	B	C	D		
SH-S525510T	380	525	10	116	11.0	200	75	250	320	3.2	System voltage: 380V or 400V * SC is controlled by APFR or connected with SC in parallel. * SR 7% is connected in series. * High-degree harmonic in the circuit will rise voltage.  Connect with 7% SR is highly recommended.
SH-S525515T			15	173	16.5	220	75	250	320	3.2	
SH-S525520T			20	231	22.0	220	140	250	320	5.6	
SH-S525525T			25	289	27.5	220	140	250	320	5.6	
SH-S525530T			30	347	33.0	220	140	250	320	5.6	
SH-S525535T			35	404	38.5	350	140	250	320	8.2	
SH-S525540T			40	462	44.0	350	140	250	320	8.2	
SH-S525545T			45	520	49.5	350	140	250	320	8.2	
SH-S525550T			50	578	55.0	350	140	370	440	10.4	
SH-S525560T			60	693	66.0	350	140	370	440	10.4	
SH-S525570T			70	809	77.0	350	140	470	540	12.6	
SH-S525575T			75	867	82.5	350	140	470	540	12.6	
SH-S525580T			80	924	88.0	350	140	470	540	12.6	
SH-S525590T			90	1040	99.0	350	140	470	540	14.8	
SH-S5255100T			100	1155	110.0	420	140	470	540	16	

## D. Series Reactor for Capacitors

### Features

- Low loss dissipation
- Low noise
- High capability of suppress surge current
- High capability of anti-harmonic
- Normal close temperature protector (optional offer)

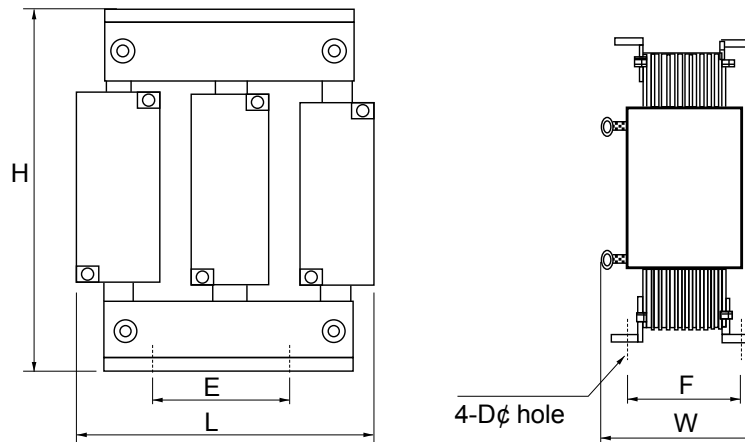


### Specification and performance

- Standard : IEC-289-1988
- Insulation : H class (180°C)
- Phase : single phase, 3 phase
- Rated frequency : 50/60Hz
- System voltage : 220V / 380V
- Rated voltage : 260V / 440V / 480V / 525V
- Capacitor's capacity : 2.5 ~ 100kVAR
- Reactor capacity : 6%, 7%, 13% and 14% of capacitor's capacity (according to customer's requirement)
- Ambient temperature : 50°C or less; shall not operate over 24hr at an average ambient temperature 35°C
- Temperature rise : 135% of rated continuous current, coil winding temperature rise shall not exceed 120°C(resistance method)
- Capacity tolerance : -5% ~ +10%.
- Maximum permissible current : the 5th harmonics current shall not exceed 35% and the synthetic current shall not exceed 120% of the rated continuous current.

## Dimensions :

(wiring terminal can be customized to be set at different point/side of the reactor)



### H class dry type series reactor

Rated voltage: 250V, 1Ø, 50Hz, 7% (System voltage: 220V)

Cat. No.	Rated Capacity		Inductance	Dimensions (mm)	Installation Dimension (mm)
	kVar	µF			
SH-SR25005S-7	5	254.6	2.7852	133×170×123	110×110
SH-SR25010S-7	10	509.3	1.3926	163×190×145	135×115
SH-SR25015S-7	15	763.9	0.9284	193×215×175	163×132
SH-SR25020S-7	20	1018.6	0.6963	193×215×175	163×132
SH-SR25025S-7	25	1273.2	0.5570	193×215×175	163×132
SH-SR25030S-7	30	1527.9	0.4642	193×245×175	163×160
SH-SR25035S-7	35	1782.5	0.3979	193×245×175	163×160
SH-SR25040S-7	40	2037.2	0.3482	240×240×175	200×160

Note. 6% & 7% reactors have the same dimension.

Rated voltage: 260V, 1Ø, 50Hz, 7% (System voltage: 220V)

Cat. No.	Rated Capacity		Inductance	Dimensions (mm)	Installation Dimension (mm)
	kVar	µF			
SH-SR26010S-7	10	470.9	1.5062	180×130×175	90×88
SH-SR26015S-7	15	706.3	1.0042	208×165×170	120×100
SH-SR26020S-7	20	941.7	0.7531	226×175×190	120×110
SH-SR26025S-7	25	1177.2	0.6025	226×185×190	135×115
SH-SR26030S-7	30	1412.6	0.5021	260×200×200	135×115
SH-SR26035S-7	35	1648.1	0.4304	260×200×200	135×115
SH-SR26040S-7	40	1883.5	0.3766	260×200×255	135×115
SH-SR26045S-7	45	2118.9	0.3347	260×200×255	135×115
SH-SR26050S-7	50	2354.4	0.3012	300×220×260	140×130

Note. 6% & 7% reactors have the same dimension.

**Rated voltage: 440V, 3Ø, 50Hz, 6% (System voltage: 380V)**

Cat. No.	Rated Capacity		Inductance	Dimensions (mm)	Installation Dimension (mm)
	kVar	µF	mh	L × W × H	E × F
SH-SR44005T-6	5	82.2	7.395	180×120×170	90×88
SH-SR44010T-6	10	164.4	3.697	180×120×170	90×88
SH-SR44015T-6	15	246.6	2.465	208×165×170	100×95
SH-SR44020T-6	20	328.8	1.849	226×175×190	120×100
SH-SR44025T-6	25	411.0	1.479	226×175×245	120×100
SH-SR44030T-6	30	493.2	1.232	226×175×245	120×100
SH-SR44035T-6	35	575.5	1.056	226×175×245	120×100
SH-SR44040T-6	40	657.7	0.924	226×175×245	120×100
SH-SR44045T-6	45	739.9	0.822	260×200×255	135×115
SH-SR44050T-6	50	822.1	0.739	260×200×255	135×115
SH-SR44060T-6	60	986.5	0.616	260×200×255	135×115
SH-SR44070T-6	70	1150.9	0.528	260×200×255	135×115
SH-SR44075T-6	75	1233.1	0.493	300×210×270	140×130
SH-SR44080T-6	80	1315.3	0.462	300×210×270	140×130
SH-SR44085T-6	85	1397.5	0.435	300×210×270	140×130
SH-SR44090T-6	90	1479.7	0.411	333×225×345	140×140
SH-SR44095T-6	95	1562.0	0.389	333×225×345	140×140
SH-SR440100T-6	100	1644.2	0.370	333×225×345	140×140

**Rated voltage: 440V, 3Ø, 50Hz, 7% (System voltage: 380V)**

Cat. No.	Rated Capacity		Inductance	Dimensions (mm)	Installation Dimension (mm)
	kVar	µF	mh	L × W × H	E × F
SH-SR44005T-7	5	82.2	8.627	180×120×170	90×88
SH-SR44010T-7	10	164.4	4.314	180×120×170	90×88
SH-SR44015T-7	15	246.6	2.876	208×165×170	100×95
SH-SR44020T-7	20	328.8	2.157	226×175×190	120×100
SH-SR44025T-7	25	411.0	1.725	226×175×245	120×100
SH-SR44030T-7	30	493.2	1.438	226×175×245	120×100
SH-SR44035T-7	35	575.5	1.232	226×175×245	120×100
SH-SR44040T-7	40	657.7	1.078	226×175×245	120×100
SH-SR44045T-7	45	739.9	0.959	260×200×255	135×115
SH-SR44050T-7	50	822.1	0.863	260×200×255	135×115
SH-SR44055T-7	55	904.3	0.784	260×200×255	135×115
SH-SR44060T-7	60	986.5	0.719	260×200×255	135×115
SH-SR44065T-7	65	1068.7	0.664	260×200×255	135×115
SH-SR44070T-7	70	1150.9	0.616	260×200×255	135×115
SH-SR44075T-7	75	1233.1	0.575	300×210×270	140×130
SH-SR44080T-7	80	1315.3	0.539	300×210×270	140×130
SH-SR44085T-7	85	1397.5	0.507	300×210×270	140×130
SH-SR44090T-7	90	1479.7	0.479	333×225×345	140×140
SH-SR44095T-7	95	1562.0	0.454	333×225×345	140×140
SH-SR440100T-7	100	1644.2	0.431	333×225×345	140×140



**Rated voltage: 480V, 3Ø, 50Hz, 6% (System voltage: 380V)**

Cat. No.	Rated Capacity		Inductance	Dimensions (mm)	Installation Dimension (mm)
	kVar	µF	mh	L × W × H	E × F
SH-SR48005T-6	5	69.1	8.801	180×120×170	90×88
SH-SR48010T-6	10	138.2	4.400	180×120×170	90×88
SH-SR48015T-6	15	207.2	2.934	208×165×170	100×95
SH-SR48020T-6	20	276.3	2.200	208×165×170	100×95
SH-SR48025T-6	25	345.4	1.760	226×175×190	120×100
SH-SR48030T-6	30	414.5	1.467	226×175×245	120×100
SH-SR48035T-6	35	483.5	1.257	226×175×245	120×100
SH-SR48040T-6	40	552.6	1.100	226×175×245	120×100
SH-SR48045T-6	45	621.7	0.978	226×175×245	120×100
SH-SR48050T-6	50	690.8	0.880	226×175×245	120×100
SH-SR48055T-6	55	759.9	0.800	260×200×255	135×115
SH-SR48060T-6	60	828.9	0.733	260×200×255	135×115
SH-SR48065T-6	65	898.0	0.677	260×200×255	135×115
SH-SR48070T-6	70	967.1	0.629	260×200×255	135×115
SH-SR48075T-6	75	1036.2	0.587	260×200×255	135×115
SH-SR48080T-6	80	1105.2	0.550	300×210×270	140×130
SH-SR48085T-6	85	1174.3	0.518	300×210×270	140×130
SH-SR48090T-6	90	1243.4	0.489	300×210×270	140×130
SH-SR48095T-6	95	1312.5	0.463	300×210×270	140×130
SH-SR480100T-6	100	1381.6	0.440	300×210×270	140×130

**Rated voltage: 480V, 3Ø, 50Hz, 7% (System voltage: 380V)**

Cat. No.	Rated Capacity		Inductance	Dimensions (mm)	Installation Dimension (mm)
	kVar	µF	mh	L × W × H	E × F
SH-SR48005T-7	5	69.1	10.267	180×120×170	90×88
SH-SR48010T-7	10	138.2	5.134	180×120×170	90×88
SH-SR48015T-7	15	207.2	3.422	208×165×170	100×95
SH-SR48020T-7	20	276.3	2.567	226×175×190	120×100
SH-SR48025T-7	25	345.4	2.053	226×175×245	120×100
SH-SR48030T-7	30	414.5	1.711	226×175×245	120×100
SH-SR48035T-7	35	483.5	1.467	226×175×245	120×100
SH-SR48040T-7	40	552.6	1.283	226×175×245	120×100
SH-SR48045T-7	45	621.7	1.141	226×175×245	120×100
SH-SR48050T-7	50	690.8	1.027	226×175×245	120×100
SH-SR48055T-7	55	759.9	0.933	260×200×255	135×115
SH-SR48060T-7	60	828.9	0.856	260×200×255	135×115
SH-SR48065T-7	65	898.0	0.790	260×200×255	135×115
SH-SR48070T-7	70	967.1	0.733	260×200×255	135×115
SH-SR48075T-7	75	1036.2	0.684	260×200×255	135×115
SH-SR48080T-7	80	1105.2	0.642	260×200×255	135×115
SH-SR48085T-7	85	1174.3	0.604	300×210×270	140×130
SH-SR48090T-7	90	1243.4	0.570	300×210×270	140×130
SH-SR48095T-7	95	1312.5	0.540	300×210×270	140×130
SH-SR480100T-7	100	1381.6	0.513	300×210×270	140×130

**Rated voltage: 525V, 3Ø, 50Hz, 6% (System voltage: 380V)**

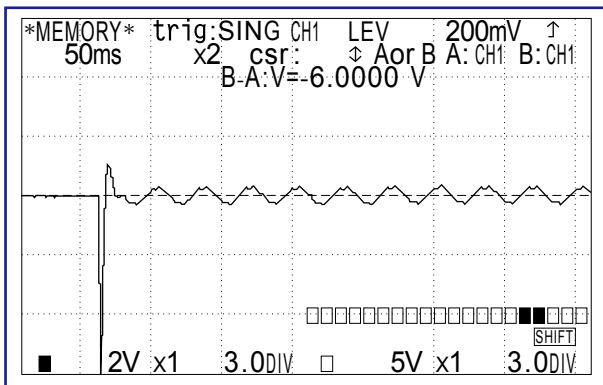
Cat. No.	Rated Capacity		Inductance	Dimensions (mm)	Installation Dimension (mm)
	kVar	µF	mh	L × W × H	E × F
SH-SR52515T-6	15	173.2	3.509	208×165×170	100×95
SH-SR52520T-6	20	231.0	2.632	208×165×170	100×95
SH-SR52525T-6	25	288.7	2.106	226×175×190	120×100
SH-SR52530T-6	30	346.5	1.755	226×175×190	120×100
SH-SR52535T-6	35	404.2	1.504	226×175×245	120×100
SH-SR52540T-6	40	461.9	1.316	226×175×245	120×100
SH-SR52545T-6	45	519.7	1.170	226×175×245	120×100
SH-SR52050T-6	50	577.4	1.053	260×200×200	135×115
SH-SR52055T-6	55	635.2	0.957	260×200×200	135×115
SH-SR52560T-6	60	692.9	0.877	260×200×255	135×115
SH-SR52565T-6	65	750.7	0.810	260×200×255	135×115
SH-SR52570T-6	70	808.4	0.752	260×200×255	135×115
SH-SR52575T-6	75	866.1	0.702	260×200×255	135×115
SH-SR52580T-6	80	923.9	0.658	260×200×255	135×115
SH-SR52585T-6	85	981.6	0.619	300×220×270	140×130
SH-SR52590T-6	90	1039.4	0.585	300×220×270	140×130
SH-SR52595T-6	95	1097.1	0.554	300×220×270	140×130
SH-SR525100T-6	100	1154.9	0.526	300×220×270	140×130

**Rated voltage: 525V, 3Ø, 50Hz, 7% (System voltage: 380V)**

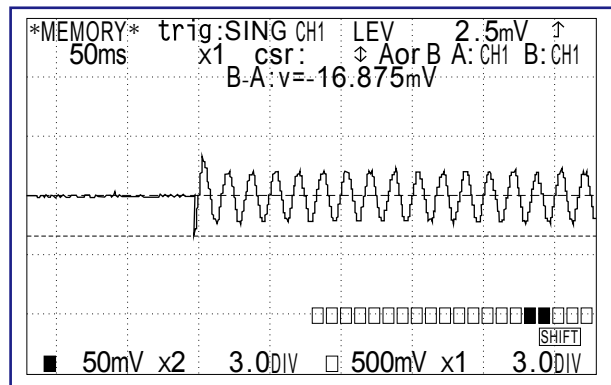
Cat. No.	Rated Capacity		Inductance	Dimensions (mm)	Installation Dimension (mm)
	kVar	µF	mh	L × W × H	E × F
SH-SR52515T-7	15	173.2	4.094	208×165×170	100×95
SH-SR52520T-7	20	231.0	3.071	208×165×170	100×95
SH-SR52525T-7	25	288.7	2.457	226×175×190	120×100
SH-SR52530T-7	30	346.5	2.047	226×175×190	120×100
SH-SR52535T-7	35	404.2	1.755	226×175×245	120×100
SH-SR52540T-7	40	461.9	1.535	226×175×245	120×100
SH-SR52545T-7	45	519.7	1.365	226×175×245	120×100
SH-SR52550T-7	50	577.4	1.228	260×200×200	135×115
SH-SR52555T-7	55	635.2	1.117	260×200×200	135×115
SH-SR52560T-7	60	692.9	1.024	260×200×255	135×115
SH-SR52565T-7	65	750.7	0.945	260×200×255	135×115
SH-SR52570T-7	70	808.4	0.877	260×200×255	135×115
SH-SR52575T-7	75	866.1	0.819	260×200×255	135×115
SH-SR52580T-7	80	923.9	0.768	260×200×255	135×115
SH-SR52585T-7	85	981.6	0.723	300×220×270	140×130
SH-SR52590T-7	90	1039.4	0.682	300×220×270	140×130
SH-SR52595T-7	95	1097.1	0.646	300×220×270	140×130
SH-SR525100T-7	100	1154.9	0.614	300×220×270	140×130



## E. Contactors for Capacitor Switching



Current curve - use regular contactor  
 Suppressed current =  $6V / 16.876mV \approx 355$  (In x)



Current curve - use capacitor-switching contactor

Cat. No.	Rated capacity AC-6b (kVAR/A)		
	220~240V	400~440V	660~690V
SC-P12	6.7/18	12.5/16	18/15
SC-P16	8.5/22	16.7/22	24/20
SC-P20	10/26	20/26	30/25
SC-P25	15/39	25/33	36/30
SC-P33	20/48	33.3/44	48/40
SC-P45	25/66	45/59	58/49
SC-P60	35/92	60/86	75/63

## F. Supplementary Accessories

### Reactive power regulator

#### Type designation

**SH - JK W □ □ □ J**

- Output mode- J: relay output; D: output DC 12V
- Output terminal #- 6/8/10/12/16/22 ways
- Function code
- Blank- basic type
- A: anti-harmonic type; B: communication interface
- W: 3 - phases compensation
- JK series
- Catalogue designation SH = Shihlin Electric



Category	Relay output	DC 12V output
Basic type	SH-JKW-4J	SH-JKW-4D
	SH-JKW-6J	SH-JKW-6D
	SH-JKW-8J	SH-JKW-8D
	SH-JKW-10J	SH-JKW-10D
	SH-JKW-12J	SH-JKW-12D
	SH-JKW-16J	SH-JKW-16D
Anti-harmonic type	SH-JKWA-12J	SH-JKWA-12D
Communication interface available	SH-JKWB-12J	SH-JKWB-12D

Technical parameters		
Operating voltage	*AC 380V ± 20%	class 0.5
Measuring voltage	*AC 380V ± 20%	class 0.5
Measuring current	AC 0 ~ 5A	class 0.5
Rated frequency	50Hz ± 5Hz	class 1.0
Sensitivity	≥ 100mA	class 1.0 (reactive power)
Power consumption	≤ 12VA	Frequency ± 0.1Hz
Dimension	144 × 144 × 110 mm	
Installation dimension	138 × 138 mm	
Ambient temperature	-25°C ~ 70°C	
Altitude	No more than 2000m above sea level	
Relative humidity	90%	
Environment conditions	No conductive particles	

\*Note: 220V AC operating and measuring voltage upon request.

## Split-phase Reactive Power Regulator



### Type designation

**SH - JK F □ □ □ J**

- Output mode - J: relay output; D: output DC 12V
- Output terminal # - 15/16 ways
- Function code
- Blank- basic type
- A: anti-harmonic type; B: communication interface
- F: Phase-splitting compensation + 3 phase compensation
- JK series
- Catalogue designation SH = Shihlin Electric


Category	Relay output	DC 12V output
Basic type	SH-JKF-16J	SH-JKF-16D
Anti-harmonic type	SH-JKFA-16J	SH-JKFA-16D
Communication interface available	SH-JKFB-15J	SH-JKFB-15D

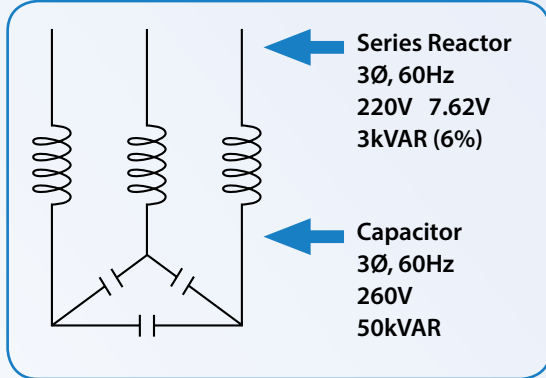
### Technical parameters

Operating voltage	*AC 220V ± 20%	class 0.5
Measuring voltage	*AC 220V ± 20%	class 0.5
Measuring current	AC 0~5A	class 0.5
Rated frequency	50Hz ± 5Hz	class 1.0
Sensitivity	≥ 100mA	class 1.0 (reactive power )
Power consumption	≤ 12VA	Frequency ± 0.1Hz
Dimension	144 × 144 × 110 mm	
Installation dimension	138 × 138 mm	
Ambient temperature	-25°C ~ 70°C	
Altitude	No more than 2000m above sea level	
Relative humidity	90%	
Environment conditions	No conductive particles	


\*Note: 220V AC operating and measuring voltage upon request.

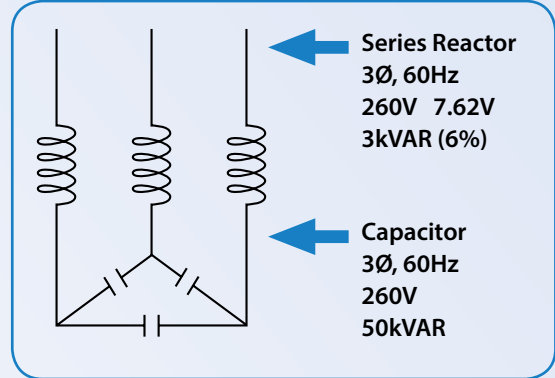
## G. Series Reactor Selection

 Wrong selection  
Rated Voltage 220V



The rated voltages of reactor and capacitor are different, the ratio of impedance is 4.3% (not 6%).

 Correct selection  
Rated Voltage 260V



The rated voltages of reactor and capacitor are the same, the ratio of impedance is 6%.

### Capacitive and Inductive reactance ratio

$$\begin{aligned} (220V / \sqrt{3}) \times 6\% &= 7.62V \\ XL &= V^2 / Q = 7.62^2 / (3k / 3) = 0.0581 \Omega \\ XC &= V^2 / Q = 260^2 / 50k = 1.352 \Omega \\ XL / XC &= 0.0581 / 1.352 = 4.3\% \end{aligned}$$

$$\begin{aligned} (260V / \sqrt{3}) \times 6\% &= 9.01V \\ XL &= V^2 / Q = 9.01^2 / (3k / 3) = 0.0811 \Omega \\ XC &= V^2 / Q = 260^2 / 50k = 1.352 \Omega \\ XL / XC &= 0.0811 / 1.352 = 6\% \end{aligned}$$

## H. Selecting Capacitor Size

Example:

Working load of the plant: 500kW

Power factor before improvement:  $\cos \theta_1 = 0.6$

Desired power factor after improvement:  $\cos \theta_2 = 0.95$

Use the formula:  $kVAR = kW \times kW \text{ factor}$

Capacitance of the capacitor required =  $500 \times 1.005 \approx 500kVAR$

(Note: 1.005 is obtained from the section L: kW factor)

Conversion between kVAR and  $\mu f$

$$C (\mu f) = \frac{kVAR \times 10^9}{2\pi f E^2}$$

If 50Hz,  $2\pi f = 314$   
If 60Hz,  $2\pi f = 377$

In the above equation:  
kVAR=Value of capacitance  
f=Frequency Hz  
E=Rated voltage V

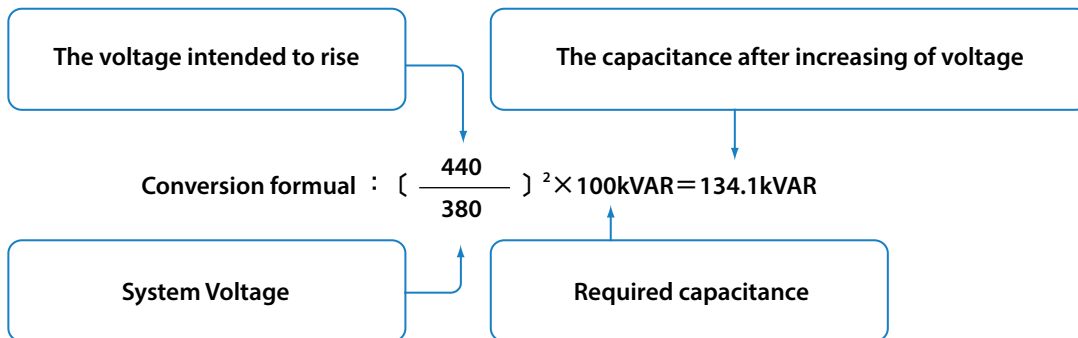
## I. Low Voltage Capacitor Coefficient Variation Calculation After Voltage Increase

System Voltage	Intended increase of reted voltage for the capacitor												
	240	260	280	300	380	400	440	460	480	500	525	600	700
220	1,190	1,397	1,620	1,860	—	—	—	—	—	—	—	—	—
240	—	1,174	1,361	1,563	—	—	—	—	—	—	—	—	—
380	—	—	—	—	—	1,108	1,341	1,465	1,596	1,731	1,909	—	—
400	—	—	—	—	—	—	1,210	1,323	1,441	1,563	1,723	2,250	—
440	—	—	—	—	—	—	—	1,093	1,190	1,291	1,424	1,860	—
460	—	—	—	—	—	—	—	—	1,089	1,181	1,303	1,701	2,316

### Example:

Assuming the system voltage is 380V, the required capacitance is 100kVAR, considering the voltage increase due to series connected reactor and high harmonics, the capacitor rated voltage is proposed to increase to 440V. The conversion formula as follows:

Required capacitor capacitance = 100kVAR × 1.341 (obtained from above table) = 134.1kVAR



## J. Capacitance Coefficient Table (kW factor)

Cos θ 1 : Power factor before improvement													
Cos θ 2 : Power factor to be improved													
Cos θ 1 \ Cos θ 2	0.80	0.85	0.90	0.91	0.92	0.93	0.94	0.95	0.96	0.97	0.98	0.99	Unity
0.50	0.982	1.112	1.248	1.276	1.303	1.337	1.369	1.403	1.441	1.481	1.529	1.590	1.732
0.51	0.936	1.066	1.202	1.23	1.257	1.291	1.323	1.357	1.395	1.435	1.483	1.544	1.686
0.52	0.894	1.024	1.16	1.188	1.215	1.249	1.281	1.315	1.353	1.393	1.441	1.502	1.644
0.53	0.850	0.980	1.116	1.144	1.171	1.205	1.237	1.271	1.309	1.349	1.397	1.456	1.600
0.54	0.809	0.939	1.075	1.103	1.13	1.164	1.196	1.23	1.268	1.308	1.356	1.417	1.559
0.55	0.769	0.899	1.035	1.063	1.092	1.124	1.156	1.19	1.228	1.268	1.316	1.377	1.519
0.56	0.730	0.860	0.996	1.024	1.051	1.085	1.117	1.151	1.189	1.229	1.277	1.338	1.480
0.57	0.692	0.822	0.958	0.986	1.013	1.047	1.079	1.113	1.151	1.191	1.239	1.300	1.442
0.58	0.655	0.785	0.921	0.949	0.976	1.01	1.042	1.076	1.114	1.154	1.202	1.263	1.405
0.59	0.618	0.748	0.884	0.912	0.939	0.973	1.005	1.039	1.077	1.117	1.165	1.226	1.368
0.60	0.584	0.714	0.849	0.878	0.905	0.939	0.971	1.005	1.043	1.083	1.131	1.192	1.334
0.61	0.549	0.679	0.815	0.843	0.87	0.904	0.936	0.97	1.008	1.048	1.096	1.157	1.299
0.62	0.515	0.645	0.781	0.809	0.836	0.87	0.902	0.936	0.974	1.014	1.062	1.123	1.265
0.63	0.483	0.613	0.749	0.777	0.804	0.838	0.87	0.904	0.942	0.982	1.03	1.091	1.233
0.64	0.450	0.58	0.716	0.744	0.771	0.805	0.837	0.871	0.909	0.949	0.997	1.058	1.200
0.65	0.419	0.549	0.685	0.713	0.74	0.774	0.804	0.84	0.878	0.918	0.966	1.027	1.169
0.66	0.388	0.518	0.654	0.682	0.709	0.743	0.775	0.809	0.847	0.887	0.935	0.996	1.138
0.67	0.358	0.488	0.624	0.652	0.679	0.713	0.745	0.779	0.817	0.857	0.905	0.966	1.108
0.68	0.329	0.459	0.595	0.623	0.65	0.684	0.716	0.75	0.788	0.826	0.876	0.937	1.079
0.69	0.299	0.429	0.565	0.593	0.62	0.654	0.686	0.72	0.758	0.798	0.84	0.907	1.049
0.70	0.270	0.4	0.536	0.564	0.591	0.625	0.657	0.691	0.729	0.769	0.811	0.878	1.020
0.71	0.242	0.372	0.508	0.536	0.563	0.597	0.629	0.663	0.701	0.741	0.783	0.850	0.992
0.72	0.213	0.343	0.479	0.507	0.534	0.568	0.6	0.634	0.672	0.712	0.754	0.821	0.963
0.73	0.186	0.316	0.452	0.48	0.507	0.541	0.573	0.607	0.645	0.685	0.727	0.794	0.936
0.74	0.159	0.289	0.425	0.453	0.48	0.514	0.546	0.58	0.618	0.658	0.7	0.767	0.909
0.75	0.132	0.262	0.398	0.426	0.453	0.487	0.519	0.553	0.591	0.631	0.673	0.740	0.882
0.76	0.105	0.235	0.371	0.399	0.426	0.46	0.492	0.526	0.564	0.604	0.652	0.713	0.855
0.77	0.079	0.209	0.345	0.373	0.4	0.434	0.466	0.5	0.538	0.578	0.62	0.687	0.829
0.78	0.053	0.183	0.319	0.347	0.374	0.408	0.44	0.474	0.512	0.552	0.594	0.661	0.803
0.79	0.026	0.156	0.292	0.32	0.347	0.381	0.413	0.447	0.485	0.525	0.567	0.634	0.776
0.80	—	0.13	0.266	0.294	0.321	0.355	0.387	0.421	0.459	0.499	0.541	0.608	0.750
0.81	—	0.104	0.24	0.268	0.295	0.329	0.361	0.395	0.433	0.473	0.515	0.582	0.724
0.82	—	0.078	0.214	0.242	0.269	0.303	0.335	0.369	0.407	0.447	0.489	0.556	0.698
0.83	—	0.052	0.188	0.216	0.243	0.277	0.309	0.343	0.381	0.421	0.463	0.530	0.672
0.84	—	0.026	0.162	0.19	0.217	0.251	0.283	0.317	0.355	0.395	0.437	0.504	0.645
0.85	—	—	0.136	0.164	0.191	0.225	0.257	0.291	0.329	0.369	0.417	0.478	0.620
0.86	—	—	0.109	0.14	0.167	0.198	0.23	0.264	0.301	0.343	0.39	0.450	0.593
0.87	—	—	0.083	0.114	0.141	0.172	0.204	0.238	0.275	0.317	0.364	0.424	0.567
0.88	—	—	0.054	0.085	0.112	0.143	0.175	0.209	0.246	0.288	0.335	0.395	0.538
0.89	—	—	0.028	0.059	0.086	0.117	0.149	0.183	0.23	0.262	0.309	0.369	0.512
0.90	—	—	—	0.031	0.058	0.089	0.121	0.155	0.192	0.234	0.281	0.341	0.484
0.91	—	—	—	—	0.027	0.058	0.09	0.124	0.161	0.203	0.25	0.310	0.453
0.92	—	—	—	—	—	0.031	0.063	0.097	0.134	0.176	0.223	0.283	0.426
0.93	—	—	—	—	—	—	0.032	0.066	0.103	0.145	0.192	0.252	0.395
0.94	—	—	—	—	—	—	—	0.034	0.071	0.113	0.16	0.220	0.363
0.95	—	—	—	—	—	—	—	—	0.037	0.079	0.126	0.186	0.329
0.96	—	—	—	—	—	—	—	—	—	0.042	0.089	0.149	0.292
0.97	—	—	—	—	—	—	—	—	—	—	0.047	0.107	0.250
0.98	—	—	—	—	—	—	—	—	—	—	—	0.060	0.203
0.99	—	—	—	—	—	—	—	—	—	—	—	—	0.143

## K. Capacitor and Reactor Selection Guide

Transformer Capacity (kVA)	30% Compensation (kVAR) (Note 1)	APFR	Qty.	Capacitor Contactor	Qty.	Reactor (7%)	Qty.	Reactor Dimension/ Installation Dimension	Cap. Type	Capacitor Capacity	Qty.	Capacitor Dimension	Capacitor Panel Dimension (W×D×H) mm	Panel Qty.
500	150	SH-JKW-10J	1	SC-P25	6	SH-SR44025T-7	6	230×175×245	Cylinder	SH-R440525T	6	116×245	1000×1000×2200	1
								120×100	Box	SH-R440525T	6	230×130×250		
630	200	SH-JKW-10J	1	SC-P25	8	SH-SR44025T-7	8	230×175×245	Cylinder	SH-R440525T	8	116×245	1000×1000×2200	1
								120×100	Box	SH-R440525T	8	230×130×250		
800	240	SH-JKW-10J	1	SC-P33	8	SH-SR44030T-7	8	230×175×245	Cylinder	SH-R440530T	8	116×245	1000×1000×2200	1
								120×100	Box	SH-R440530T	8	230×130×250		
1000	300	SH-JKW-10J	1	SC-P33	10	SH-SR44030T-7	10	230×175×245	Cylinder	SH-R440530T	10	116×245	1200×1000×2200	1
								120×100	Box	SH-R440530T	10	230×130×250		
1250	400	SH-JKW-10J	1	SC-P60	8	SH-SR44050T-7	8	270×205×255	Box	SH-R440550T	8	350×140×370	1200×1000×2200	1
								135×115		SH-R440550T	8			
1600	480	SH-JKW-16J	1	SC-P33	16	SH-SR44030T-7	16	230×175×245	Cylinder	SH-R440525T	16	116×245	1000×1000×2200	1
								120×100	Box	SH-R440525T	16	230×130×250		
2000	600	SH-JKW-10J	1	SC-P60	10	SH-SR44060T-7	10	270×205×255	Box	SH-R440560T	10	350×140×370	1200×1000×2200	1
								135×115			10			
2500	750	SH-JKW-16J	1	SC-P60	15	SH-SR44050T-7	15	270×205×255	Box	SH-R440550T	15	350×140×370	1200×1000×2200	1
								135×115			15			
3150	950	SH-JKW-16J	1	SC-P60	16	SH-SR44060T-7	16	270×205×255	Box	SH-R440560T	16	350×140×370	1200×1000×2200	1
								135×115			16			

Note 1. The compensative capacity should be adopted depending on the real condition at the plant.

2. The capacitor and reactor selection above is based on 3 phase 440V and 7% relative impedance condition.

3. If other voltage level product demand, please contact us.

## L. Capacitor Inspection and Maintenance

### Capacity measurement (1) – Clamp-on current meter

Due to capacity and current are in direct proportion, therefore technician can use clamp-on current meter to do measurement under power-on condition.

1. Series 6% or 7% SR  
If R,S,T current decline by 15%, replacing capacitor is advised
2. Series 13% SR  
If R,S,T current decline by 10%, replacing capacitor is advised
3. Capacitor only (no any SR)  
If R,S,T current decline by 30%, replacing capacitor is advised

PS: The measurement method suit for all voltage range capacitors.

### Capacity measurement (2)– capacity meter

Phase – Phase & Total capacity:

$$U-V=a(\mu F)$$

$$U-W=b(\mu F) \therefore (a+b+c) \times 2 \div 3 = \text{total capacity}$$

$$V-W=c(\mu F)$$

Note.

The new unit, the capacity is -5%~+15%.

Warning: Disconnect the power for 3 minutes before test

1. Series 6% or 7% SR  
If capacity decrease by 15%, replacing capacitor is advised
2. Series 13% SR  
If capacity decrease by 10%, replacing capacitor is advised
3. Capacitor only  
If capacity decrease by 30%, replacing capacitor is advised



## M. Daily Maintenance

1. Ambient temperature below 50 °C,
2. Mounting distance(2 units): Minimum 50 mm
3. Attention:
  - 3.1 Ambient temperature of new installation capacitor
  - 3.2 Ventilation circumstance
  - 3.3 Ambient temperature which might be risen by heat source radiation of equipment
4. Check if any abnormal condition at wiring connection and capacitor terminals
5. Check voltage and current:
  - 5.1 If current decrease over 10% while it's under normal voltage condition, must replace with new capacitor immediately. (If there is no new one on hand, have to power off the capacitor.)
  - 5.2 If the current exceed 10% when it's under normal voltage condition, need to check the capacitor or reactor, anything wrong. Had better to check the capacitance or/and inductance by meter.
6. Check any abnormal phenomenon.
7. If any deformation of appearance of capacitor, the capacitor must be replaced.

### Regular maintenance

1. Indoor use special location( Dust, Corrosion, etc···) : Clean the dust and surface to avoid the shortage by insulation broken and lose the safety device function by corrosion the case, even the heat go away.
2. All capacitors must be cleaned regularly to help release surface heat.

### Precautions

1. To protect capacitor from overlap voltage damage, between switch off and on have to wait at least 3~5 minutes.
2. Adopt series reactor, when load side has a large number of harmonics and use APFR
3. Avoid to switch all capacitors on at same time, due to instant surge current of approximately 71 to 163 times.
4. Choose higher voltage level capacitor and Series Reactor for prevent high overlap harmonic and harmonic amplification effect.
5. When the ambient temperature is 70°C, the product life of capacitor is only 20% of original
6. Circuit breaker or fuse selection should consider its overload capability, harmonic effect and inrush current of its switch-on.
7. Suggestion:
  - (1) Major circuit adopts NFB for safety.
  - (2) Each section circuit adopts HRC fuse to strengthen safety.
8. Recommend adopting Shihlin capacitor contactor, switchgear and reactor to suppress surge current.
9. Install lightning arrester and surge protective device in power panel is highly recommended.



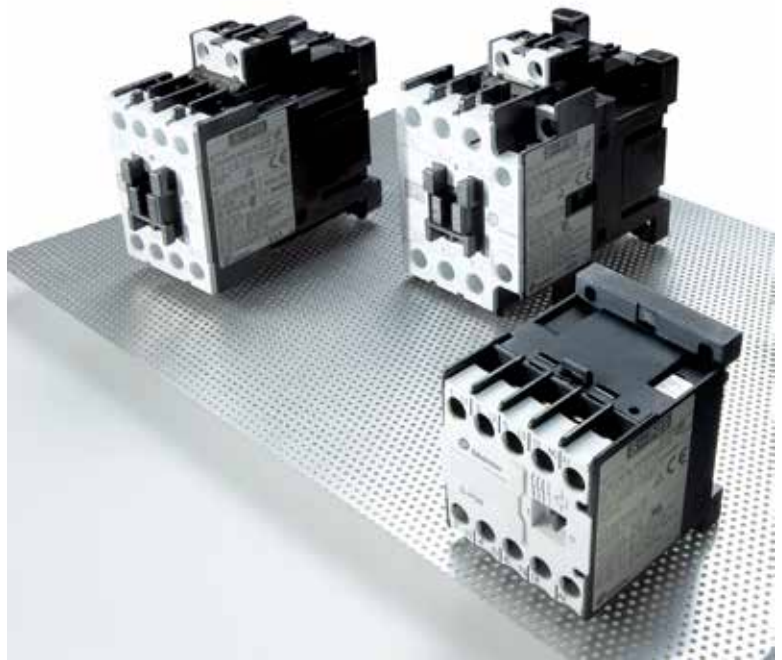


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